苔藓植物系统发育

角苔类、藓类、苔类

角苔植物门

角苔

叶状体近圆形或条带状，常莲座状
念珠藻生于裂口的粘液腔内
(通常藉由粘液裂口生于腹面)
叶绿体通常每细胞单个，含蛋白核
具油滴；不具导水细胞

精子器1到多数，内生起源；颈卵器单一，嵌入叶状体背面表面
生毛体：齿条 12 微管（无萌发孔）片状条菱形，2个基体等大，并列生长
受精卵纵向分裂，胚呈三列
不具蒴柄；孢子体含叶绿体，通常呈角状
藉由无限分生组织的活动从基部生长，蒴轴发育良好或不良好
孢子体具气孔；假弹丝（绝大多数为多细胞）；持续生产孢子
具木脂素，不产类黄酮
约 200 种

苔类植物门

苔类

叶状体型的或叶状的
具假根
具油体
具孔的导水细胞
与内生的球囊菌门形成真菌共生体
配子囊具保护结构
配子囊的个体发育不经由顶端细胞
生毛体：质体和相关的后置线粒体位于细胞末端
受精卵横向分裂：表层与基下细胞
孢蒴不具蒴轴
弹丝（单细胞的）
不具气孔
约 5000 种
半月苔酸

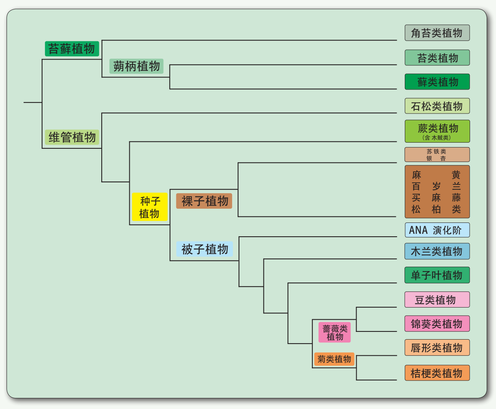
蒴柄植物门

藓类植物门

藓类

原丝体叶状
茎叶体
叶细胞为薄壁细胞
假根多细胞
不具菌根
配子囊的个体发育经由顶端细胞
生毛体：质体和相关的后置线粒体沿着细胞核内表面分布；会出现歧走微管
孢蒴具蒴齿和蒴轴
不具弹丝
孢子体上可具气孔
约 13000 种

Plant Phylogeny Posters on ResearchGate



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COLE TCH, HILGER HH, GOFFINET B, ZHANG L, YE W (2023) 苔藓植物系统发育

Chinese version of: COLE, HILGER, GOFFINET (2023) BRYOPHYTE Phylogeny Poster (BPP)

- 假设的系统树建立在分子系统发育数据的基础之上
- 枝长是有意为之的，不表示实际的时间尺度
- 省略了一些次要的目／科
- 特征不一定适用于分支内的所有成员

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Leiosporocerotales	Leiosporocerotaceae (*Leiosporoceros*)
Anthocerotales	Anthocerotaceae (*Anthoceros* s.l., incl. *Sphaerosporoceros* and *Folioceros*)
Notothyladales	Notothyladaceae (*Notothylas, Mesoceros, Phaeoceros, Paraphymatoceros*)
Phymatocerotales	Phymatocerotaceae (*Phymatoceros*)
Dendrocerotales	Dendrocerotaceae (*Dendroceros, Megaceros, Nothoceros, Phaeomegaceros*)
Calobryales	Treubiaceae Haplomitriaceae
Blasiales	Blasiaceae
Neohodgsoniales	Neohodgsoniaceae
Sphaerocarpales	Sphaerocarpaceae Monocarpaceae Riellaceae
Marchantiales	Aytoniaceae Cleveaceae Conocephalaceae Corsiniaceae Cyathodiaceae Dumortieraceae Exormothecaceae Lunulariaceae Marchantiaceae Monosoleniaceae Oxymitraceae Ricciaceae Targioniaceae
Pelliales	Pelliaceae Noterocladaceae
Fossombroniales	Fossombroniaceae Petalophyllaceae Allisoniaceae Calyculariaceae Makinoaceae
Pallaviciniales	Pallavicinaceae Hymenophytaceae Moerckiaceae Phyllothalliaceae Sandeothallaceae
Pleuroziales	Pleuroziaceae
Metzgeriales	Aneuraceae Metzgeriaceae
Ptilidiales	Ptilidiaceae Herzogianthaceae Neotrichocoleaceae
Porellales	Lepidolaenaceae Porellaceae
Radulales	Radulaceae
Frullaniales	Frullaniaceae
Lejeuneales	Lejeuneaceae
Jubulales	Jubulaceae
Perssoniellales/Schistochilales	Perssoniellaceae Schistochilaceae
Myliales	Myliaceae
Lophoziales	Lophoziaceae
Lepidoziales	Lepidoziaceae
Jungermanniales	Acrobolbaceae Anastrophyllaceae Balantiopsaceae Calypogeiaceae Cephaloziaceae Cephaloziellaceae Geocalycaceae Gymnomitriaceae Jungermanniaceae Lophocoleaceae Plagiochilaceae Scapaniaceae Trichocoleaceae
Takakiales	Takakiaceae
Sphagnales	Sphagnaceae Flatbergiaceae Ambuchananiaceae
Andreaeales	Andreaeaceae
Andreaeobryales	Andreaeobryaceae
Oedipodiales	Oedipodiaceae
Tetraphidales	Tetraphidaceae
Polytrichales	Polytrichaceae
Buxbaumiales	Buxbaumiaceae
Diphysciales	Diphysciaceae
Gigaspermales	Gigaspermaceae
Funariales	Funariaceae
Disceliales	Disceliaceae
Encalyptales	Encalyptaceae
Timmiales	Timmiaceae
Catoscopiales	Catoscopiaceae
Distichiales	Distichiaceae Timmiellaceae
Flexitrichales	Flexitrichaceae
Scouleriales	Scouleriaceae Drummondiaceae Hymenolomataceae
Bryoxiphiales	Bryoxiphiaceae
Pseudoditrichales	Pseudoditrichaceae
Grimmiales	Grimmiaceae Seligeriaceae Ptychomitriaceae
Archidiales	Archidiaceae Leucobryaceae Micromitriaceae
Pleurophascales	Pleurophascaceae
Eustichiales	Eustichiaceae
Amphidiales	Amphidiaceae
Dicranales	Dicranaceae Calymperaceae Fissidentaceae Dicranellaceae Aongstroemiaceae
Rhabdoweisiales	Rhabdoweisiaceae Rhachitheciaceae Schistostegaceae
Sorapillales	Sorapillaceae
Erpodiales	Erpodiaceae
Bruchiales	Bruchiaceae
Ditrichales	Ditrichaceae
Pottiales	Pottiaceae (incl. Ephemeraceae)
Hedwigiales	Hedwigiaceae Helicophyllaceae Rhacocarpaceae
Splachnales	Meesiaceae Splachnaceae
Bartramiales	Bartramiaceae
Bryales	Bryaceae Mniaceae Plagiomniaceae
Rhizogoniales	Cyrtopodaceae Mitteniaceae Rhizogoniaceae Spiridentaceae
Orthotrichales	Orthotrichaceae
Orthodontiales	Orthodontiaceae
Aulacomniales	Aulacomniaceae
Hypnodendrales	Braithwaiteaceae Hypnodendraceae Pterobryellaceae Racopilaceae
Ptychomniales	Garovagliaceae Ptychomniaceae Orthorrhynchiaceae Rhabdodontiaceae
Hypopterygiales	Hypopterygiaceae
Hookeriales	Daltoniaceae Hookeriaceae Leucomiaceae Pilotrichaceae Saulomataceae Schimperobryaceae
Hypnales	Amblystegiaceae Anomodontaceae Brachytheciaceae Calliergonaceae Cryphaeaceae Hypnaceae Hylocomiaceae Lembophyllaceae Leskeaceae Meteoriaceae Miyabeaceae Neckeraceae Plagiotheciaceae Pterobryaceae Pylaisiaceae Pylaisiadelphaceae Sematophyllaceae Thuidiaceae Trachylomataceae